Run Coordinators' Report

Detector Operations
ND DAQ

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Fermilab

PAY YOUR REGISTRATION FEE

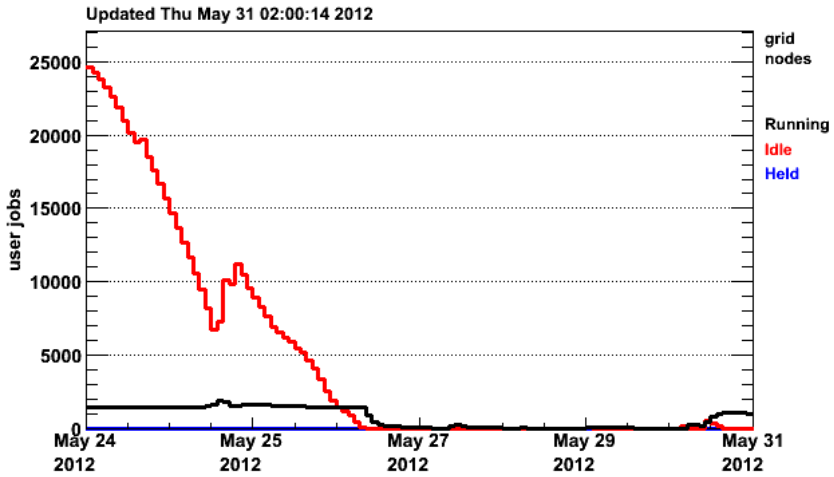
MINOS Status Report
June

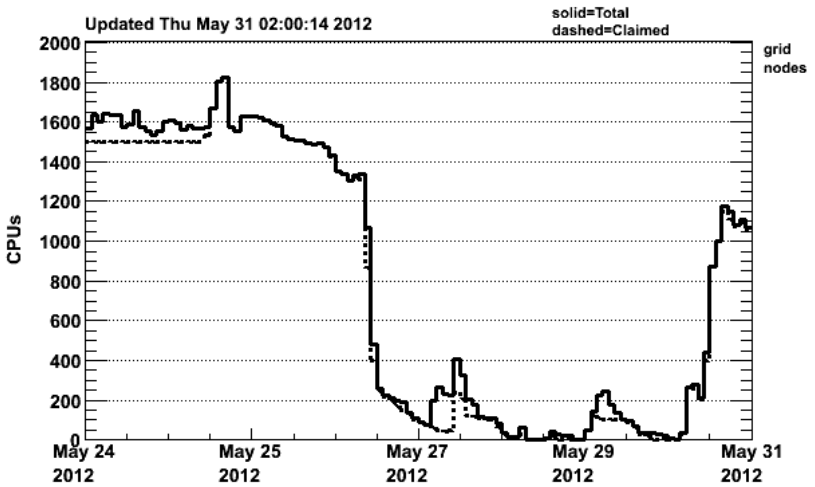
- ND
  - Power to ND magnet off since week of shutdown
    - Initial checkout by Walt Jaskierny; more thorough checkout in coming months
    - New air handling system handled reduced heat load flawlessly
  - Have run ND DAQ continuously; runs with fewer problems w/o beam
  - No regular shifts but have fixed problems as they occur: so far two Minders boards (new one to be replaced)
  - Continued cleanup of MINOS surface building in preparation for sealing of main room for NOvA wall construction (to block dust into MINOS/Minerva) and NOvA off-axis hall construction
- FD
  - Power to FD magnet briefly reversed and returned to forward direction to cancel errors for MINOS UP (universal physics = atmospheric neutrinos) group
  - FD DAQ also running continuously; FD day shifts still running

MINOS Status Report

June

- Thanks to CD for supplying resources to finish production of full data set before Neutrino 2012!





MINOS Status Report
June

- DAQ Refurbishment for ND:
  - Replace old expensive RIO3 readout processors (ROPs) with MVME 5500s
  - Replace old obsolete PVIC fiber/copper communications between ROPS and DAQ computers with gigabit Ethernet
  - Replace old (circa 2000) DAQ servers in 3 racks with newer (2009?) servers in 1 (ok, really 1/2) rack; processes can run in any new server instead of being dedicated to a particular server as in old system
  - Intention is to be able to run new and old DAQ in parallel (though not simultaneously) for comparison
  - This frees up extra spares for FD; if successful, consider doing same to FD
- Recent progress:
  - DAQ rebuilt and working on new servers with new packages on SL6 (instead of SL4); only ROOT is problem since low-level drawing routines have changed functionality–still working on this but not critical
  - Have established communications between MVME ROP and branch processor (DAQ server), next in chain is trigger processor (another DAQ server)
  - Thanks to Bill Badgett, Geoff Savage, and Donatella Torretta of the PPD/EED/Online Support Group
  - Also, new rack with servers contributed from CDF in place; final configuration being worked on

MINOS Status Report

July

- ND
  - ND brought back after sheduled outage with no problems
  - Confusion (on my part) about responsibilities for cooling system. Shutdown/startup procedure now changed to avoid confusion; since the magnet load was not present, temps did not alarm
  - Timing crate UPS has fault; currently, bypassed
- FD
  - Problem with one ROP under investigation (eventually replaced)
  - Timing syncing issues investigated; some due to leap second adjustment
  - Talking to DNR about chiller replacement

MINOS Status Report

July

- DAQ Refurbishment for ND—Recent progress:
  - System which make up data control process have been rebuilt as separate entities; one is interface to MINOS offline
  - Systems can communicate with each other; code is ready for testing
  - Most processes are running in test stand at D0
  - Most of readout chain is working

MINOS Status Report

August

- ND
  - Rack cleanup
    - All racks vacuumed and all filters cleaned
    - Wiener power supply/chassis checked for problems
    - Power lugs on both power supplies and VME crates inspected for proper tightening
    - Unfortunately, ROP0 problems prevented running DAQ during cleanup (now fixed)
    - Some problems found from cleanup(?):
      - Environmental controls (NI Fieldpoint) power supply fixed
      - Some connections found loose
      - Currently working on ROP1 which is giving problems
    - Thanks to Dan Ruggerio, Megan Freiler, and Navaneeth Poonthottathil
- FD
  - Readout continuing to work well
  - DCS (environmental monitoring) machines at FD upgraded
  - New chiller for Soudan experiments (CDMS, MINOS, etc.) on P.O.

MINOS Status Report

August

- DAQ Refurbishment for ND—Recent progress:
  - Have established communications between MVME ROP and branch processor (DAQ server), then in turn to trigger processor (another DAQ server) in test rack. This has run for 10 days. Next step: write data out.
  - Dan, Megan, and Navaneeth ran cables for new DAQ from every Master crate to new DAQ rack location underground
  - Power distribution for new DAQ rack still being worked on (Dave Huffman)

MINOS Status Report

September/October

- ND
  - Bringing detector back up after long power outage for power distribution work for new DAQ rack initially went well, but then had problems with ROP0, which eventually had to be replaced
  - Found ROP0 had scrambled nvram; CES imparts command to reset this
  - Eventually use former ROP0 to fix problem in ROP7 with no problem (both ROPs initially had battery problem)
  - Also, had many DCS and RPS problems; eventually fixed all
  - Excavation starts September 9 with drilling and inserting rock botls (only time no work 1730-1930)
- FD
  - Detector maintanence:
    - Replacing UPS batteries
    - Testing smoke detectors
    - Repalcing electrolytic caps
    - Order new PCs and PC power supplies
  - Replacement chiller ordered, received, and installed
  - Magnet maintenance by Walt Jaskierny in Soudan– power supply, magnet, relays, and interlocks
  - Ran with no magnet for special physics runs with cosmics

MINOS Status Report

September/October

- DAQ Refurbishment for ND—Recent progress:
  - Meeting with sysadmins for technical support of computers in new DAQ system
  - New gateway, DCS, and DCP computers now reside in new DAQ rack
  - New DAQ rack safety system being testing by Dave Huffman and Linda Bagby
  - ORC document finished by Bill Badgett
  - Last week finished installing MVMEs in all Master crates; no interference found with existing DAQ
  - This week installed and successfully tested rack safety system in new DAQ rack

MINOS Status Report

To Do

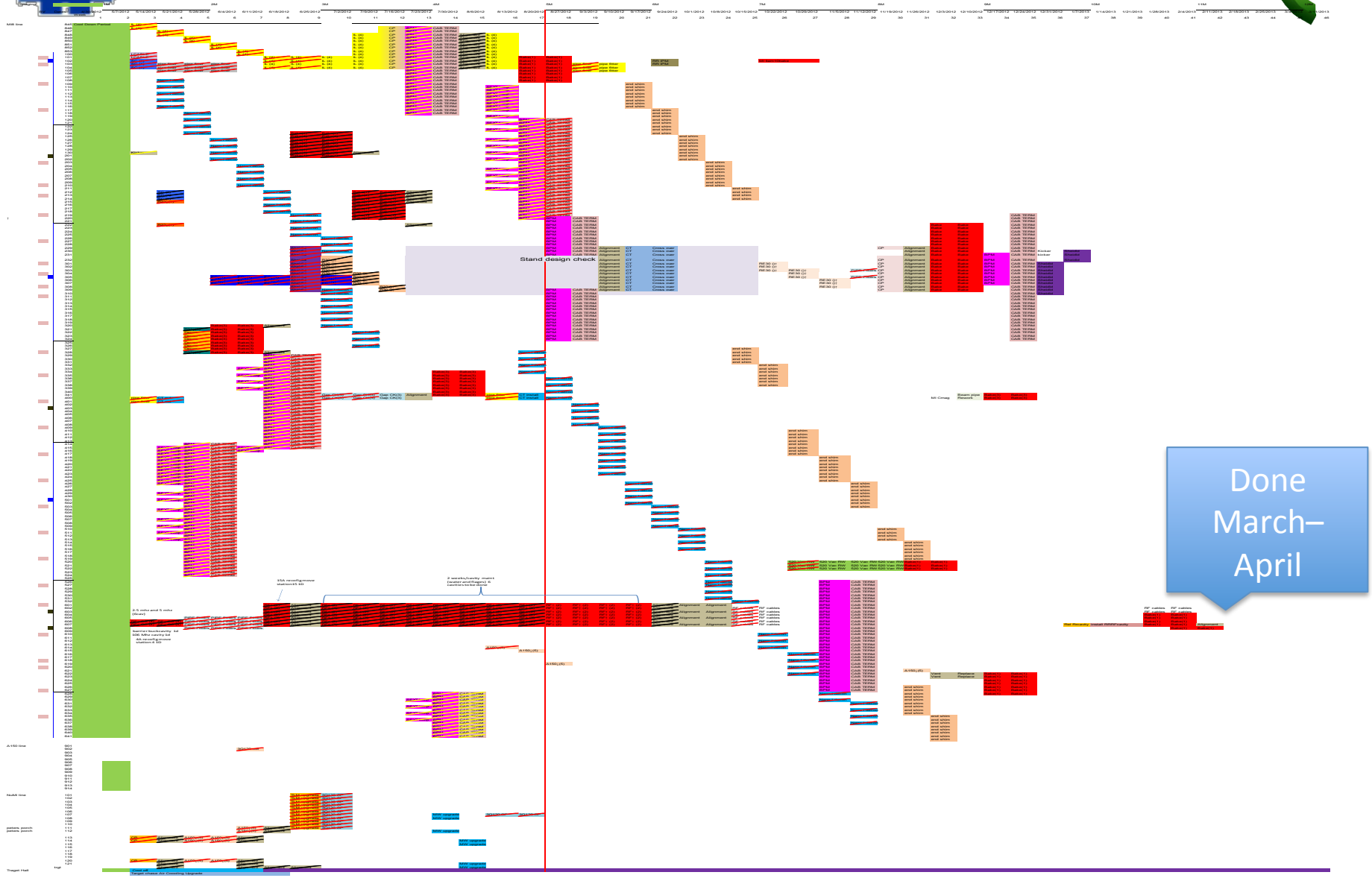
- ND
  - HV has been off on ND since September 9; have Acnet devices to monitor vibration (seismometers, water levels, geotilt monitors) but not clear what criteria to use to turn HV back on; in discussions with Minerva how to do this
  - Continue to run DAQ to deal with problems as quickly as possible; has been running almost a week now with no problem
  - Last cleanup item: get RPS's repaired with RC on power input; will slowly work through these with Merle Watson's help
  - Also, increase spare MENU cards with Merle Watson's building these as background job (already made 4 as test); want ~200 total
- FD
  - FD supply of RIO3s exhausted, working on solution (may be short term give them one of ours, long term get RIO3s repaired)

MINOS Status Report

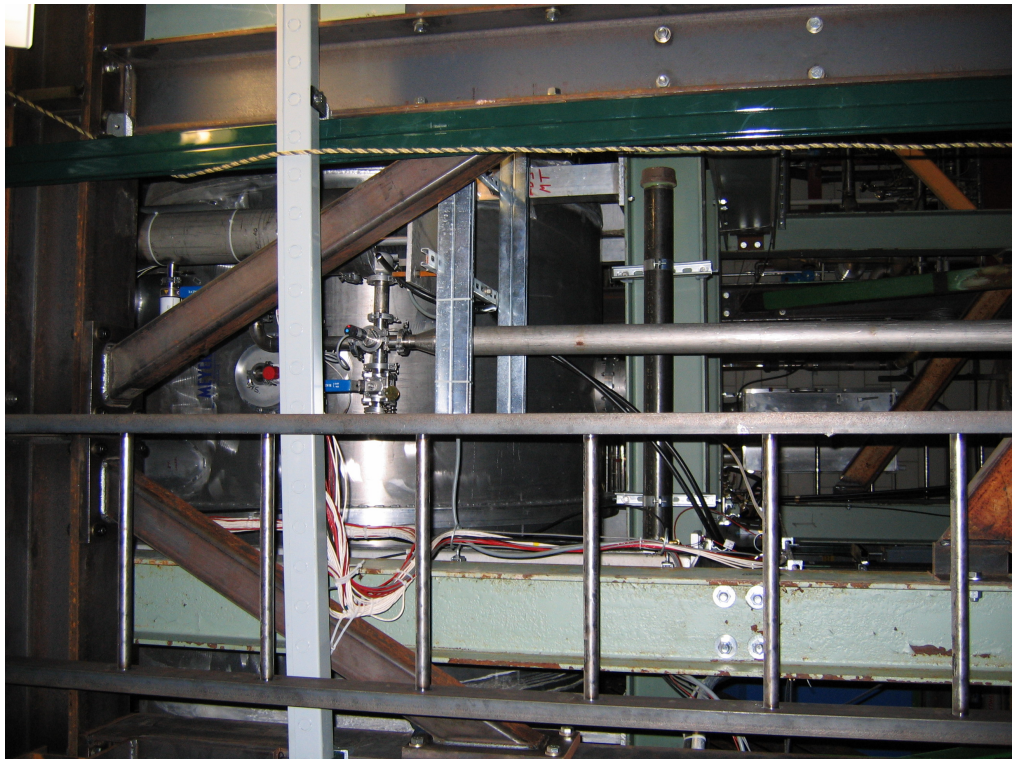
To Do

- DAQ Refurbishment for ND—Recent progress:
  - Get ORC committee convened and do review of new DAQ rack; Linda Bagby helping with this
  - After ORC review, can run new DAQ rack unattended; then can start serious development of whole readout system
  - Should be able to switch between new and existing DAQ with nothing more than reboots of front-end processors
  - Still working on actual readout of data; had some shared memory problems (shared memory cannot sit at physical address as in existing system)
  - Thanks to Bill Badgett, Geoff Savage, and Donatella Torretta of the PPD/EED/Online Support Group

AD Schedule – Cons Gattuso



Minerva Deuterium Target

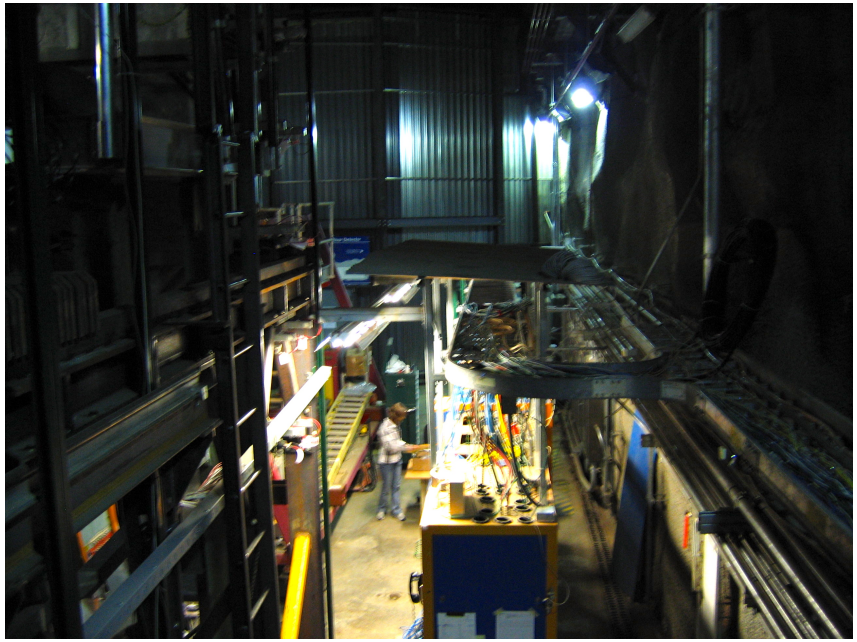


- Target vessel used in last run with He
- Planning to eventually (> 3 years) run with deuterium:
  - Need funds for external reviewer to proceed
  - Deuterium too expensive to buy; instead rented
  - New shaft to surface and deuterium recovery plant
  - Large air velocity to shunt venting deuterium to recovery plant
  - Zoned area (herculite tent?) to contain vented deuterium
  - May require changes to equipment (sparkproof lights?); will certainly require changes to procedures
  - Planning on hold till funds for reviewer available
  - Debbie Harris happy to answer questions

MINOS Status Report

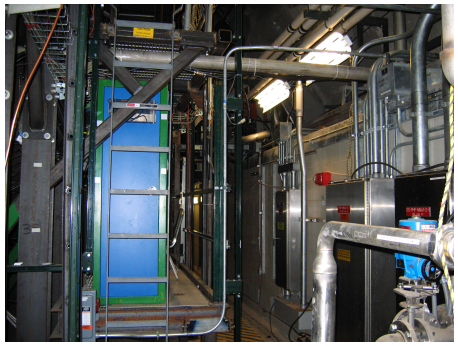
- Rack cleanup
  - All racks vacuumed
  - All filters cleaned
  - Wiener power supply/ chassis checked for problems
  - Power lugs on both power supplies and VME crates inspected for proper tightening
  - Still to do:
    - Check power supply caps by watching voltage sag when DAQ starts; only requires power cycle to insert power card in VME crates
    - RC fix to Rack Protection System boxes to prevent race condition which plagues turn-on

Show and Tell Infrastructure



- NOvA off-axis hall construction well underway (drilling, inserting rock bolts, milling, and road header)
- Steel wall seperating MINOS/Minerva from construction area with independent ventilation
- Dust-free but for one incident
  - Storm front reversed pressure differential; now fixed with more fans

Show and Tell Infrastructure



- DAQ rack improvements:
  - Overhead wireway 120 and 240 V plugs added for new DAQ rack
  - 3 other racks with 120 V hardwired in
  - 1 MINOS TOF rack
  - 2(?) NOvA racks
  - Huge improvement—fluorescent lights for both MINOS and Minerva DAQ racks
- Chilled water improvements continue to regulate flawlessly even with ND magnet off
- Thanks to Aria and IFTB group!

Show and Tell
ND DAQ refurbishment

- Minder racks unchanged
- Timing rack unchanged
- Master racks:
  - Now added MVME 5500 in 6U-to-9U adapter with Gigabit Ethernet, serial, and reset cables
  - MVMEs flush with front of crate makes repairs much easier than RIO3's
  - RIO3's and extender cards remain as is
  - So far, tested in all Master crates to not interfere with existing DAQ

Show and Tell
ND DAQ refurbishment

- 8 1U quad core computers running multiple processes replace 3 racks of dedicated computers
  - Only 4 1U computers used; remainder are spares
- All but power cords are plenum rated in new DAQ rack; all cables approved by Jim Priest
- Simple RPS to drop power in rack if smoke detected (thanks to Linda Bagby and Dave Huffman)

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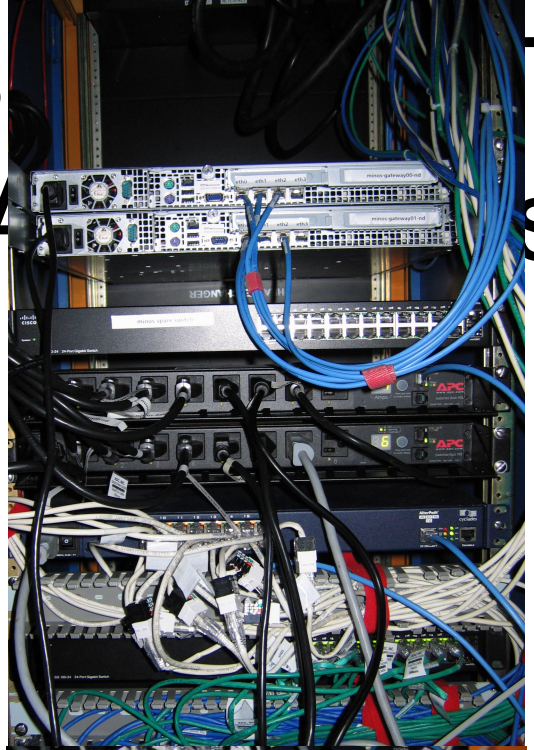
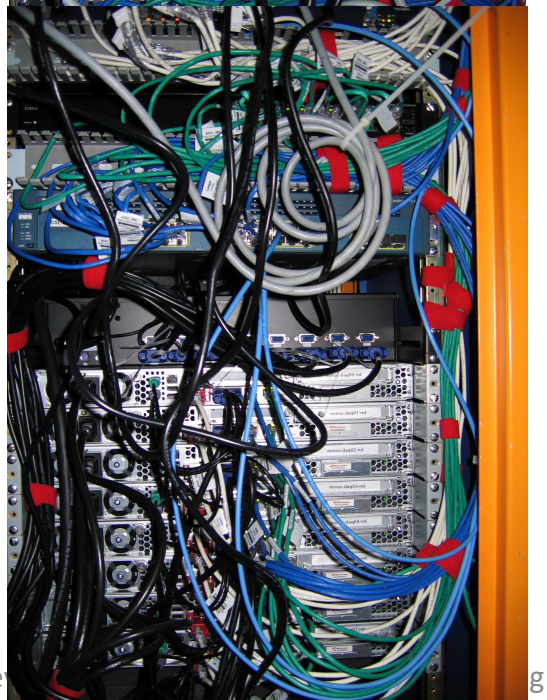


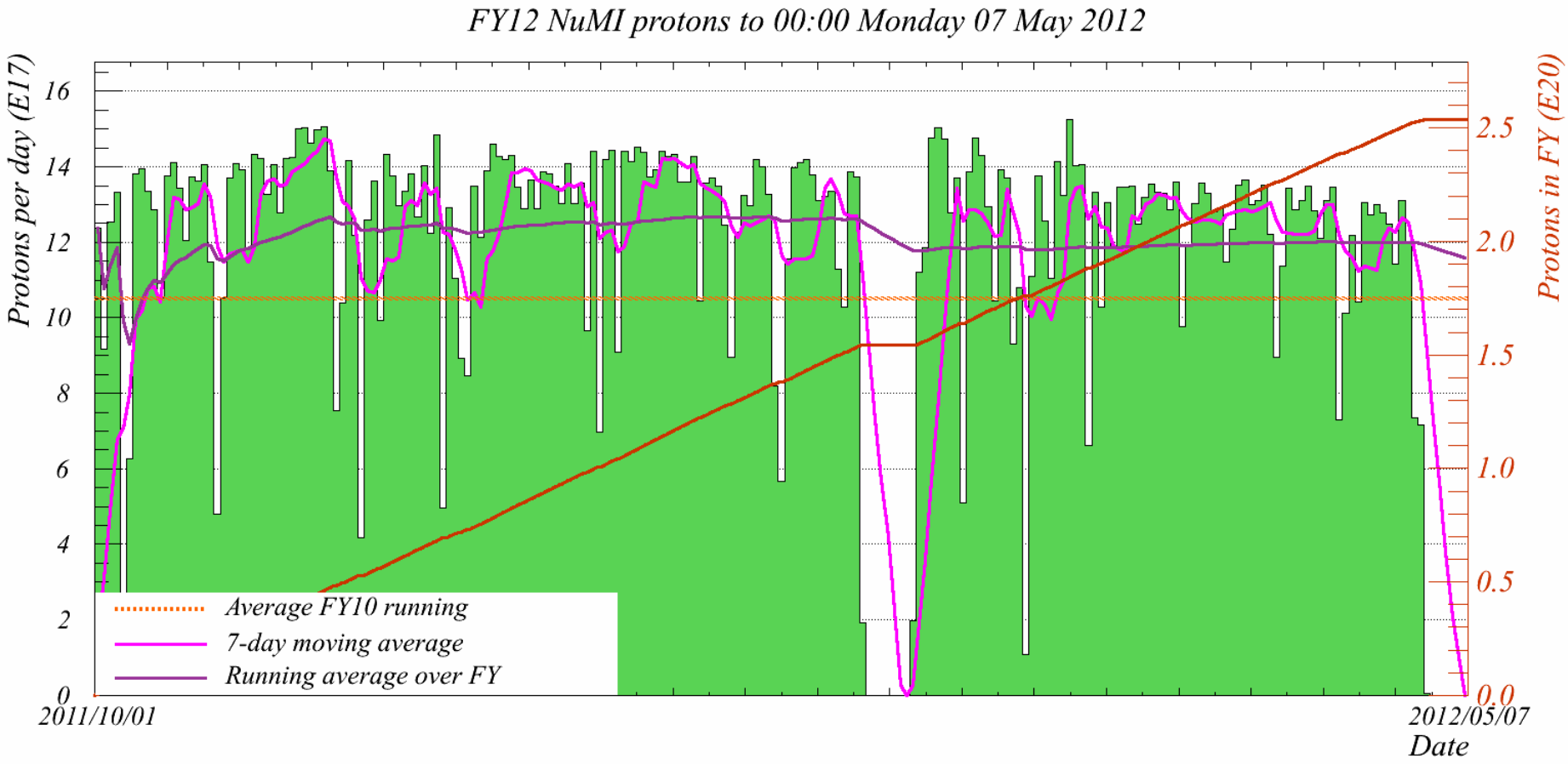


- Note KVM with slide-out monitor and keyboard for local system admin
- Air flow in crate from front to back via computer fans; air exhausts through top
- Many items in back of rack:
  - Gigabit routers
  - Serial port selectors
  - KVM
  - PDUs
  - TPCs (Plezzi model) switchable power for rack protection
  - Disclaimer: not all cables dressed properly

Supplementary Slides

NuMI-MINOS Status Report

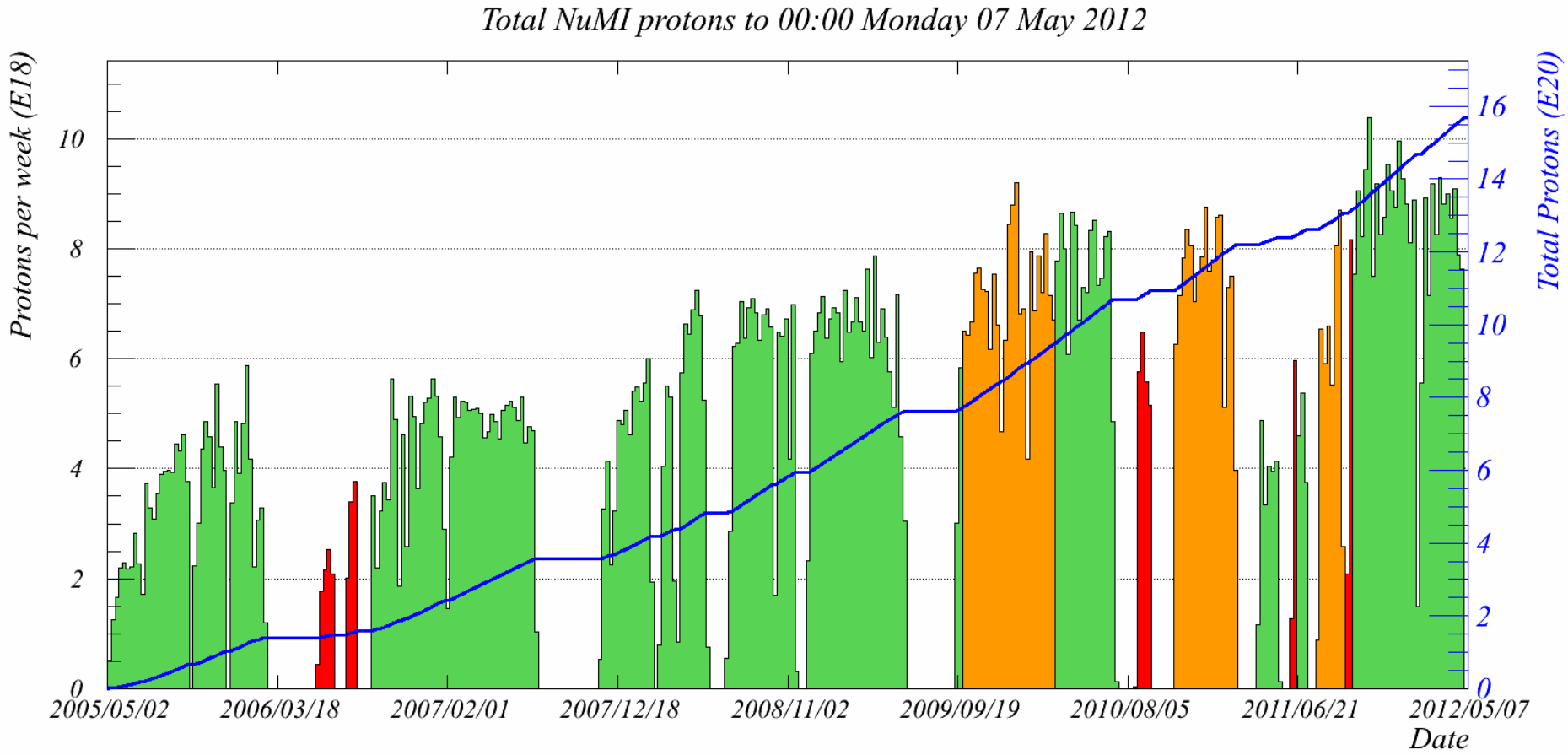
- FY2012: 2.5×10^{20} POT



NuMI-MINOS Status Report

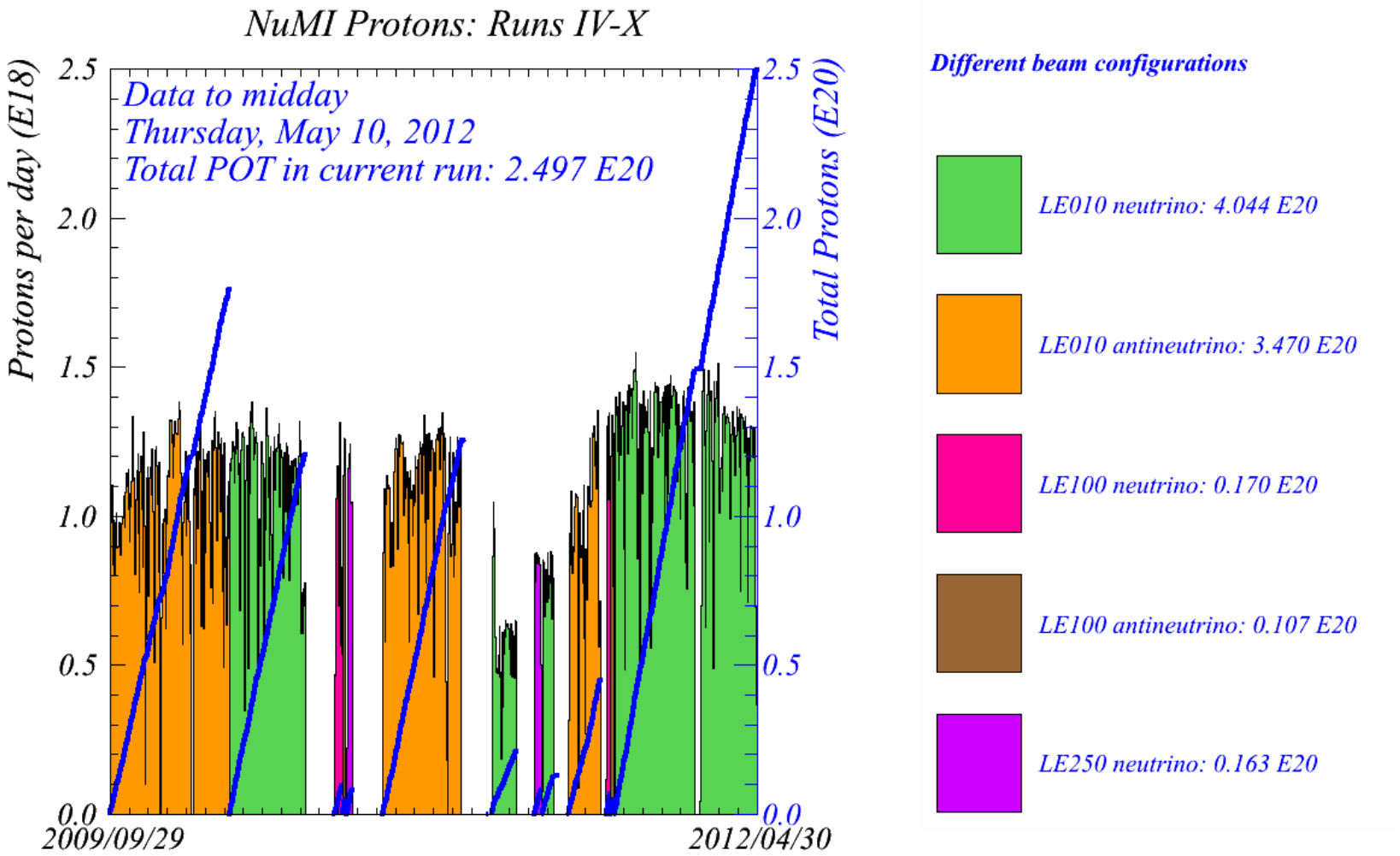
Protons on Target (since 2005)

- Total Protons: ~15.7 × 10^{20}



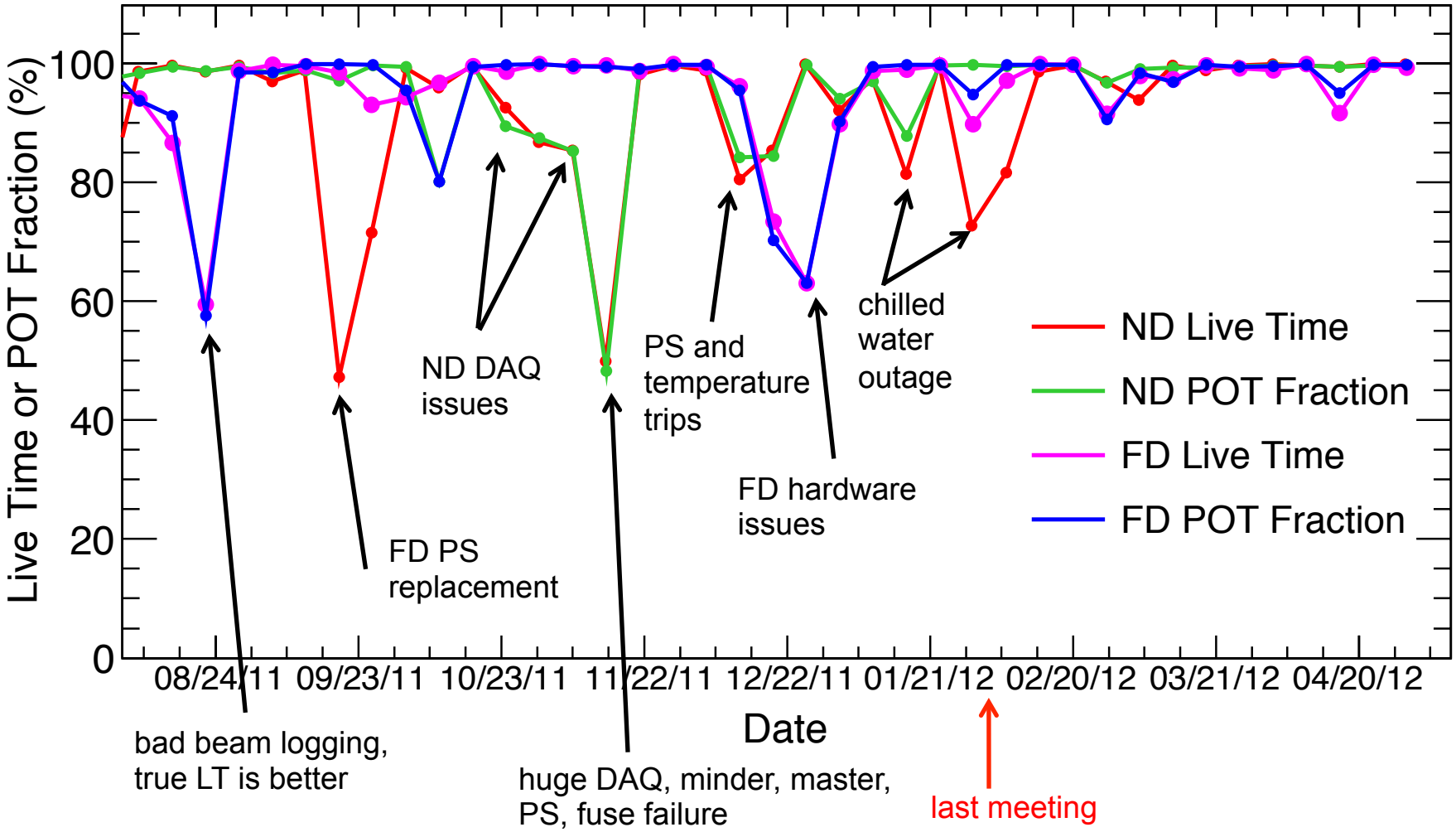
NuMI-MINOS Status Report

Protons to NuMI target in FY2010 and FY2011



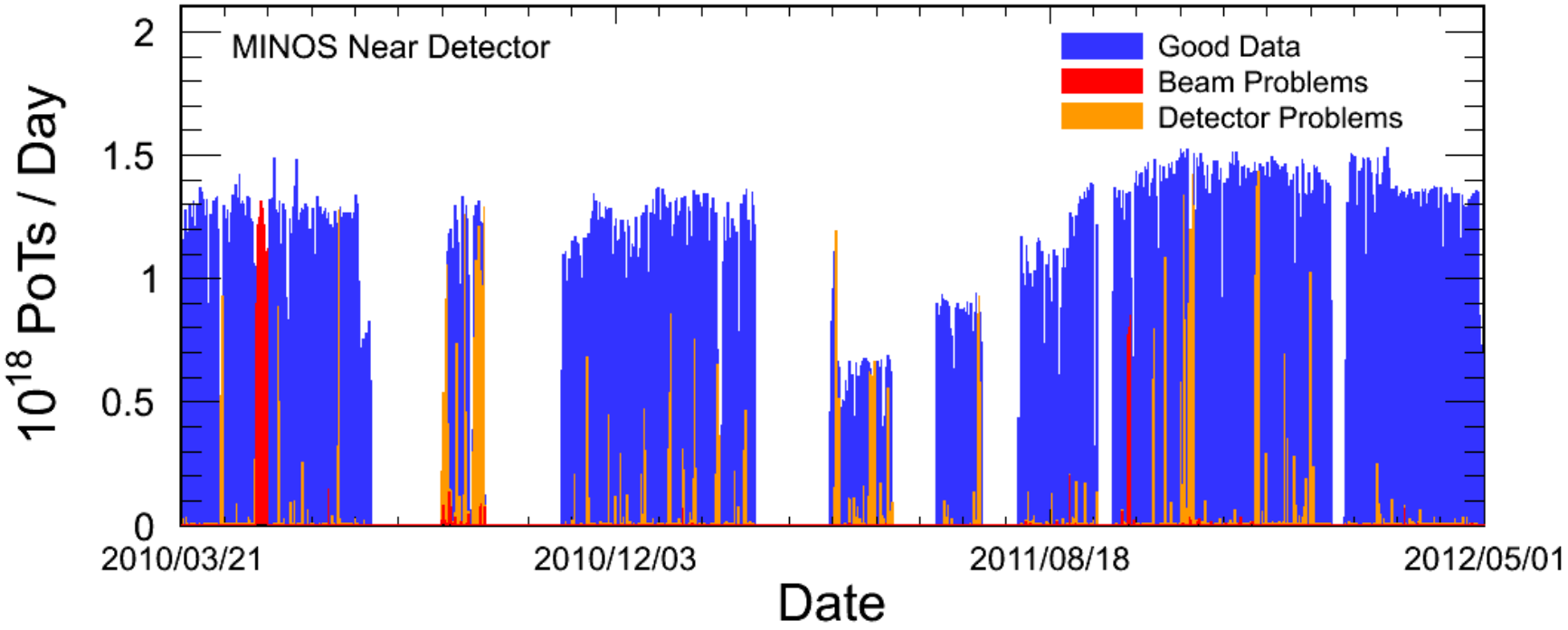
MINOS Status Report

Since last meeting, running very smoothly!



NuMI-MINOS Status Report

Another way to look at it.



Plans for the Shutdown

- No routine shifts, however:
  - Staff at Soudan will be present and will monitor FD during the day
  - Staff at Soudan has automated calling/texting system for problems
  - Run coordinators will monitor ND during the day
  - Working on a similar automated system for ND

Control Room and Computing

Control Room:

- Update all MINOS software
- Upgrade all computers (SLF6 likely)
- Revisit underground access protocols (mostly finalized)
- Convert to standard beam data logging (current protocol is obsolete)
- All XOC independent but ready

Computing Infrastructure:

- Replace gateway, DCS, and underground utility computers
- Update data archiver software to current standard
- Retire AFS mounting in the control room
- Restructure software installation
- Revisit extended scope of remote shift capability

People involved: Art Kreymer, John Urish, Rennie Scott

DAQ Refurbishment

- Current MINOS ND DAQ PC's are >8 years old
- Read Out Processors are no longer being made by vendor
- New ones take >3 months to procure and are expensive
- Communication handled by component for which spares cannot be procured, want to switch to ethernet

- Test stand in D0 current addressing these issues
  - May use CDF middle-aged PC's instead, this likely to work
  - May use Motorola MVME5500 (a la D0) instead of old MINOS processors
  - this not guaranteed but will be BIG savings of time and money if it does work

- Estimate: < 1 month (left) of testing at D0 and deciding what final system looks like, followed by 2 months of installation and 2 months of commissioning (below ground)

People involved: Donatella Torretta, Jeff Savage, Steve Hahn, Bill Badgett

Underground/Magnet Maintenance

At the surface building:

- UPS battery inspection
- Replace rack air filters and vacuum dust from all racks
- Test smoke detectors and radon monitors
- Test spare electronics boards (several types)
- Commission the recently pulled/terminated fibers (DONE)
- Ensure ample supply of spare equipment/hardware (spare parts list)

For the magnet (applies to both FD/ND):

- Full power supply inspection and measurements (Walt working on ND)
- Inspect reversing switch
- Inspect physical magnet
- Inspect interlock wiring
- Inspect remote magnet reset

People involved: Benton Pahlka, Steve Hahn, Howard Budd, Jerry Meier, Alec Habig, Walt Jaskierny, and others